

Title Characterisation of *Penicillium digitatum* isolates for fungicide resistance

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Abstract

Citrus green mould, caused by *Penicillium digitatum* is one of the most important postharvest diseases of citrus. Fungicide treatments are a key component in the integrated management of many plant diseases, therefore the appearance of resistance has become an important factor in limiting the efficacy. The most recent thought for fungicide resistance is based on active efflux of these toxic compounds due to transporters like ABC (ATP binding cassette) or MFS (Major Facilitator Superfamily) that have a remarkably broad substrate specificity although they can also transport specific compounds. Despite the size of the economic losses caused by this fungus, another important aspect is that some of these resistant genes may be involved in pathogenicity/ virulence. To uncover these factors relevant to fungicide resistance we analysed at the molecular level the differences between resistant and sensitive *P. digitatum* strains. A single point mutation in the β -tubulin gene was found to be responsible for thiabendazol resistance while different mutations were identified in two ABC transporters, PMR1 and PMR5. The method involved detection of the presence of the tandem repeat of five copies of a 126 bp transcriptional in the promoter region of PdCYP51, leading to overexpression of this gene and conferment of DMI resistance to the fungus. The absence of this repeat does not imply that *P. digitatum* is DMI-sensitive. In fact, many isolates with a high degree of resistance to DMIs only exhibited one repeat, supporting the hypothesis that many factors could be involved in fungicide resistance.